Computer Science

IMAGE SEGMENTATION USING PIXEL LEVEL TEXTURE, Mikhail G Kalinin,

Daniela Stan Raicu*, Jacob Furst
Intelligent Multimedia Processing Laboratory, School of Computer Science, Telecommunications and Information Systems, DePaul University, 243 South Wabash Avenue, Chicago, IL 60604
draicu@cs.depaul.edu

Computerized image segmentation is an important problem. Applications of image segmentation can range from medical field to machine vision and defense fields. Our goal was to accurately segment organs including liver, heart, spleen, kidney and backbone from the computerized tomography images (CT) of the chest and of the abdomen. In order to perform the segmentation, we introduced the notion of "pixel level texture" which calculates the texture of a pixel within a certain window. Our initial implementation deals with window size of five by five pixels. We extracted ten co-occurrence descriptors for each pixel and applied decision tree algorithm to classify each pixel in the image to a certain organ.
We divided the data into two sets: training and testing; on the training data we built a decision tree classifier and on the testing data we validated our classifier. On both training and testing data the accuracy of the classifier was above 80%. These results are encouraging and they motivate us to pursue with this approach in order to improve the classification accuracy at the pixel level that will be incorporated into the segmentation problem.